# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/005,063 | 12/04/2001 | Stuart T. Linsky | 22-0148 | 9562 |

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| EXAMINER |
|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2637 | |

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/005,063 | LINSKY ET AL. |
| | Examiner | Art Unit | |
| | Qutub Ghulamali | 2637 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 December 2001*.

2a)☐ This action is **FINAL**.  2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-27* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All  b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
    Paper No(s)/Mail Date _____.  

4) ☐ Interview Summary (PTO-413)  
    Paper No(s)/Mail Date. _____.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: _____.

# DETAILED ACTION

## *Claim Rejections - 35 USC § 112*

1.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter, which the applicant regards as his invention.

2.      Claims 1, 18 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

3.      Regarding claim 1, claim 1 recites the limitation "said multiple decoded data" in lines 10-

11. There is insufficient antecedent basis for this limitation in the claim.

4.      Regarding claim 18, claim 18 recites the limitation "the set of vector pairs" in line 8.

There is insufficient antecedent basis for this limitation in the claim.

5.      Regarding claim 27, claim 27 recites the limitation "said down converter" in line 2.

There is insufficient antecedent basis for this limitation in the claim.

## *Double Patenting*

6.      The nonstatutory double patenting rejection is based on a judicially created doctrine
grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or
improper timewise extension of the "right to exclude" granted by a patent and to prevent possible
harassment by multiple assignees. See *In re Goodman*, 11 F.3 d 1046, 29 USPQ 2d 2010 (Fed.
Cir. 1993); *In re Longi*, 759 F. 2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.
2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F. 2d 438, 164 USPQ 619 (CCPA 1970);
and, *In re Thorington*, 418 F. 2d 528, 163 USPQ 644 (CCPA 1969).
        A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to
overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130 (b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7.      Claims 1-9 are provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claims 1-9 of copending

Application No. 10/005,049.

Although the conflicting claims are not identical, they are not patentably distinct from each other

because claims of the application are clearly encompassed by claims of the copending

application.

Regarding claim 1 in the instant application, the complex samples in a data

communication system, whereas in the copending application claim 1, recites "complex samples

in a burst". The communication as disclosed in the instant application is a complex samples in a

data communication system known to impress intelligent information to be conveyed onto a

carrier for transmission by one of many different (plurality of) modulation techniques as

designed. Therefore, in the copending application the data communication system can by design

choice, work equally well. Given the facts, it would have been obvious to one skilled in the art

at the time the invention was made to present the claim in an alternate way so as to enhance the

data communication system.

Similarly, in the instant application the phase detector receives complex data samples and a

plurality of different phase/frequency estimates and generates phase differences, whereas in the

copending application the phase detector receives complex data samples. Since the phase

detector in both instance can accept complex data and phase estimates, it would be obvious to

one skilled in the art at the time the invention was made to present the claim in an alternate way

so that different phase differences can be obtained.

Regarding claims 2-9, the claimed subject matter in the instant application mirrors

(verbatim) that of the copending application claims 2-9.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting

claims have not in fact been patented.

8.      Claims 1-9 are provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claims 1-9 of copending

Application No. 10/004,773.

Although the conflicting claims are not identical, they are not patentably distinct from each other

because claims of the application are clearly encompassed by claims of the copending

application.

Regarding claim 1 in the instant application, it is shown that the inner block decoder

generates multiple decoded data. Whereas in the copending application the inner block decoder

generate partial decode values. Since the decoder in the instant application can generate multiple

decoded data it can very easily generate partial decode data as programmed. Therefore, it would

be obvious to one skilled in the art at the time the invention was made to present the claim in an .

alternate way so that upon program, the decoder could generate partial decoder values.

Regarding claims 2-9, the claimed subject matter in the instant application mirrors

(verbatim) that of the copending application claims 2-9.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims ·

have not in fact been patented.

### Claim Rejections - 35 USC § 103

9.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.     Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caso et al

(US Patent No. 6,236,687) in view of Odenwalder (US Patent 6,396,804) and further in view of

Khayrallah et al (US Patent 5,983,385).

Regarding claim 10, Caso discloses a demodulator unit (fig. 1, element 22), demodulate

an input signal in a data communications system comprising:

a phase lock loop, having a first block decoder configured to detect a set of vector pairs of the

input modulated signal at a decode rate to generate a set of associated code words and a

phase/frequency error estimate, wherein said set vector pairs input data is processed multiple

times with different initial phase and frequency estimates to calculate a plurality of

phase/frequency error estimates (col. 3, lines 23-35; col. 4, lines 9-17). Caso, however, is silent

regarding:

a selection circuit which receives the plurality of phase/frequency estimates from the phase lock

loop and selects one phase/frequency error estimate from among the plurality of phase/frequency

error estimates. Odenwalder in a similar field of endeavor discloses, a communications system

wherein a selection circuit which receives the plurality of phase/frequency estimates from the

phase lock loop and selects one phase/frequency error estimate from among the plurality of

phase/frequency error estimates (col. 14, lines 35-47). It would have been obvious to one skilled

in the art at the time the invention was made to use a selection circuit selects one

phase/frequency error estimate from among the plurality of phase/frequency error estimates as

taught by Odenwalder in the system Caso because the selection process can facilitate processing

of data in a faster and efficient manner.

Caso and Odenwalder combined discloses every feature of the claimed invention. However,

Caso and Odenwalder combined fail to disclose:

a second block decoder which receives the phase/frequency estimates selected by said selection

circuit and corrects errors in the set of associated codewords using the selected phase/frequency

estimates. Khayrallah in a similar field of endeavor discloses;

a second decoder which receives the phase/frequency estimates selected by said selection circuit

and corrects errors in the set of associated codewords using the selected phase/frequency

estimates (col. 7, lines 20-42).

It would have been obvious to one skilled in the art at the time the invention was made to use a

second decoder to correct errors in the set of associated codewords as taught by Khayrallah in the

circuit of Caso and Odenwalder so as to provide improved error correcting capability.

Regarding claim 11, Caso, Odenwalder and Khayrallah, in combination disclose

substantially every feature of the claimed invention in claim 10. More over, Khayrallah in a

similar field of endeavor further discloses a communications system and method wherein a

selective recursive decoding process based on reliability metric produced by the decoding means

(556a and 556b) (col. 6, lines 38-55; col. 8, lines 10-21). Therefore it would have been obvious

to one skilled in the art at the time the invention was made to use a block decoder to generate

reliability metric results as taught by Khayrallah in the circuit of Caso and Odenwalder because it can provide enhanced capabilities with less complex encoder and decoder designs.

Regarding claim 12, Caso, Odenwalder and Khayrallah in combination, disclose substantially every feature of the claimed invention in claim 11. More over, Khayrallah in a similar field of endeavor further discloses reliability metric results comprise correlation results taken during decoding by said first block decoders (col. 7, lines 20-42). Therefore it would have been obvious to one skilled in the art at the time the invention was made to use a reliability metric results with the coding process as taught by Khayrallah in the circuit of Caso and Odenwalder because it can provide correlation and error correction during decoding.

Regarding claim 13, Caso, Odenwalder and Khayrallah, in combination, discloses substantially every feature of the claimed invention in claim 11. Further more, Khayrallah in a similar field of endeavor discloses, a second decoder selects codewords from said set of associated codewords based on the reliability metric results from said first block decoders (col. 7, lines 20-42).
It would have been obvious to one skilled in the art at the time the invention was made to use a codewords from first decoder by the second decoder based on reliability results from the first decoder as taught by Khayrallah in the circuit of Caso and Odenwalder so as to provide improved burst error correcting capability.

Regarding claim 14, Caso discloses discloses block decoder comprises a Reed-Muller block decoder (col. 7, lines 56-60).

Regarding claim 15, Caso, Odenwalder and Khayallah, in combination discloses substantially every feature of the claimed invention in claim 14. More over, Khayrallah in a

similar field of endeavor further discloses, block decoder (Reed-Muller) determines the phase

error estimate based on the composite decoded codeword phase error relative to reference (col. 2,

lines 51-64; col. 7, lines 20-42).

It would have been obvious to one skilled in the art at the time the invention was made to use a

codewords from first decoder by the second decoder based on reliability results from the first

decoder as taught by Khayrallah in the circuit of Caso and Odenwalder so as to provide

improved burst error correcting capability.

Regarding claims 16 and 17, Caso, Odenwalder and Khayrallah in combination discloses

substantially every feature of the claimed invention in claim 15. Further more, Kayrallah in a

similar field of endeavor, discloses second block decoder preselect the codewords from among a

set of associated codewords (comprise of first codewords) (col. 8, lines 10-20). It would have

been obvious to one of ordinary skill in the art at the time the invention was made to use a

second outer block decoder preselect the codewords from among a set of associated codewords

as taught by Khayrallah in the circuit of Caso and Odenwalder because it can improve the

iterative decoding process by minimizing errors.

## *Claim Rejections - 35 USC § 103*

11.    The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

12.     Claims 18-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caso et al

(US Patent No. 6,236,687) in view of Odenwalder (US Patent 6,396,804) and further in view of

Khayrallah et al (US Patent 5,983,385).

        Regarding claim 18, Caso discloses a demodulator unit (fig. 1, element 22), demodulate

an input signal in a data communications system comprising:

a plurality of phase locked loops which provide respective estimates of the phase of said input

modulated signal, each one of said phase locked loops receiving the input modulated signal and

calculating a phase estimate using a different combination of frequency and initial phase estimate

(col. 1, lines 54-60), and comprising a first block decoder which decodes the set of vector pairs

of said input modulated signal at a decode rate to generate a set of associated codewords and a

phase/frequency error estimate (col. 3, lines 23-35; col. 4, lines 9-17).  Caso, however, is silent

regarding:

a selection circuit which receives the plurality of phase/frequency estimates from each one of the

phase lock loop and selects one phase/frequency error estimate from among the plurality of

phase/frequency error estimates.  Odenwalder in a similar field of endeavor discloses, a

communications system wherein a selection circuit which receives the plurality of

phase/frequency estimates from the phase lock loop and selects one phase/frequency error

estimate from among the plurality of phase/frequency error estimates (col. 14, lines 35-47).  It

would have been obvious to one skilled in the art at the time the invention was made to use a

selection circuit selects one phase/frequency error estimate from among the plurality of

phase/frequency error estimates as taught by Odenwalder in the system Caso because the

selection process can facilitate processing of data in a faster and efficient manner.

Caso and Odenwalder combined discloses every feature of the claimed invention. However,

Caso and Odenwalder combination is silent regarding:

a second block decoder which receives the phase/frequency estimates selected by said selection

circuit and corrects errors in the set of associated codewords using the selected phase/frequency

estimates. Khayrallah in a similar field of endeavor discloses:

a second decoder which receives the phase/frequency estimates selected by said selection circuit

and corrects errors in the set of associated codewords using the selected phase/frequency

estimates (col. 7, lines 20-42).

It would have been obvious to one skilled in the art at the time the invention was made to use a

second decoder to correct errors in the set of associated codewords as taught by Khayrallah in the

circuit of Caso and Odenwalder so as to provide improved error correcting capability.

Regarding claim 19, Caso discloses said input modulated signal comprises a phase shift

keying modulated signal (col. 3, lines 13-18).

Regarding claim 20, Caso, Odenwalder and Khayrallah, in combination disclose every

feature of the claimed invention in claim 18. Further more, Khayrallah in a similar field of

endeavor discloses a communications system and method wherein a selective recursive decoding

process based on reliability metric produced by the decoding means (556a and 556b) (col. 6,

lines 38-55; col. 8, lines 10-21). Therefore it would have been obvious to one skilled in the art at

the time the invention was made to use a block decoder to generate reliability metric results as

taught by Khayrallah in the circuit of Caso and Odenwalder because it can provide enhanced

capabilities with less complex encoder and decoder designs.

Regarding claim 21, Caso, Odenwalder and Khayrallah, in combination disclose

substantially every feature of the claimed invention in claim 20. Further more, Khayrallah in a

similar field of endeavor discloses reliability metric results comprise correlation results taken

during decoding by said first block decoders (col. 7, lines 20-42). Therefore it would have been

obvious to one skilled in the art at the time the invention was made to use a reliability metric

results with the coding process as taught by Khayrallah in the circuit of Caso and Odenwalder

because it can provide correlation and error correction during decoding.

Regarding claim 22, Caso, Odenwalder and Khayrallah, in combination disclose every

feature of the claimed invention in claim 20. Further more, Khayrallah in a similar field of

endeavor discloses a second block decoder dynamically selects codewords from said set of

associated codewords based on the reliability metric results from the corresponding first block

decoders (col. 7, lines 20-42).

It would have been obvious to one skilled in the art at the time the invention was made to use a

codewords from first decoder by the second decoder based on reliability results from the first

decoder as taught by Khayrallah in the circuit of Caso and Odenwalder so as to provide

improved burst error correcting capability.

Regarding claim 23, Caso discloses discloses block decoder comprises a Reed-Muller

block decoder (col. 7, lines 56-60).

Regarding claim 24, Caso, Odenwalder and Khayrallah, in combination disclose every

feature of the claimed invention in claim 23. Further more, Khayrallah in a similar field of

endeavor discloses a block decoders determine the phase error estimate based on the composite

decoded codeword phase error relative to reference (col. 7, lines 20-42).

It would have been obvious to one skilled in the art at the time the invention was made to use reference codewords from first decoder by the second decoder based on reliability results from the first decoder as taught by Khayrallah in the circuit of Caso and Odenwalder so as to provide improved burst error correcting capability.

Regarding claims 25 and 26, Caso, Odenwalder and Khayrallah in combination discloses substantially every feature of the claimed invention in claim 24. More over, Kayrallah in a similar field of endeavor, further discloses second block decoder preselect the codewords from among a set of associated codewords (col. 7, lines 20-42; col. 8, lines 10-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a second outer block decoder preselect the codewords from among a set of associated first codewords as taught by Khayrallah in the circuit of Caso and Odenwalder because it can improve the iterative decoding process by minimizing errors.

Regarding claim 27, Caso discloses a communication receiver wherein converter down converts said input modulated signal into an intermediate frequency signal, and wherein said communication receiver further comprises;

a synchronous demodulator (fig. 2, element 210) which demodulates said intermediate frequency signal from a baseband quadrature pair into a sequence of complex sample pairs (col. 6, lines 27-46); and

a matched filter (212) and sampler which passes said sequence of complex sample pairs and samples at a symbol rate to produce said succession of baseband signal samples (col. 6, lines 35-58).

## *Conclusion*

13.    The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

O'shea et al (US Pub. 2003/0156672) discloses frame synchronization and detection.

Smith et al (US 2004/0105516) shows a digital data receiver synchronization having a plurality of phase lock loops.

Edison et al (US 2004/0042566) discloses symbol reliability determination comprising of received symbols.

Dent (US Patent 5,151,919) shows CDMA demodulation and modulation system optimally decode coded information.

Branlund et al (US 2003/0086366) discloses adaptive communications methods and network of codewords.

Hassan et al (US Patent 5,968,198) discloses decoder utilizing soft information output to minimize error rate.

14.    Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG.
March 7, 2005.

JAY K. PATEL
SUPERVISORY PATENT EXAMINER